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Twenty-eighth session
June 1981
Agenda item 6(d)

COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

Special Programme for Research and Training in Tropical Diseases (Phase II) (GLO/80/005)

Estimated UNDP contribution:	$7,567,300
Duration:	Four years
Executing Agency:	The World Bank will act as fiscal agent and the World Health Organization (WHO) will be responsible for the implementation of project activities

I. Background

1. At its January 1978 meetings (E/1978/53/Rev.1, ANNEX II, para. 6), the Governing Council approved a contribution of $5.5 million for the Special Programme for Research and Training in Tropical Diseases (TDR), of which UNDP is a co-sponsor together with WHO and the World Bank. 1/ This contribution followed preparatory assistance 2/ in the amount of $107,500 which the Council approved at its twenty-second session in June 1976 (E/5846/Rev. 1, para. 298), bringing the total amount thus far contributed by UNDP to the Programme to $5,607,500. The Programme has two broad objectives, namely: (a) promotion and support of research aimed at developing new and improved tools for the prevention, diagnosis and treatment of

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1/ DP/PROJECTS/R.9/Add.4.

2/ DP/PROJECTS/R.6/Add.1.

* This document will be derestricted upon approval of the project. See document DP/526, which will be issued in June 1981.

six major tropical diseases; and (b) strengthening of national institutions, including training, for the purpose of increasing the research capabilities of the developing countries affected by the diseases. The six diseases included within the purview of the Programme are: malaria, schistosomiasis, filariasis, trypanosomiasis (both African Sleeping sickness and Chagas' disease), leishmaniasis and leprosy. Together, these diseases affect hundreds of millions of persons in Africa, Asia and Latin America, at enormous cost in terms of human well-being and economic productivity.

2. The Programme is now in full swing, and has elicited impressive support from the international donor community, as well as from research institutions and individual scientists around the world. During the year 1980 22 Governments and organizations co-operating with the Programme contributed $22.7 million towards its support, for a total of $70.6 million contributed since the Programme's inception. The UNDP Regional Bureaux for Africa and for Asia and the Pacific are contributing to the trypanosomiasis and malaria components of the Programme. Extensive links with the world scientific community have been established and continue to be expanded. The Programme is now in communication with some 10,000 scientists and institutions. Of these, approximately 4,300 are in the developing endemic countries. The Programme also collaborates with the pharmaceutical industry in research and development towards production and field application of new drugs, vaccines and diagnostic tests. To date, over 40 scientists from industry have participated in TDR activities and more than 70 collaborative projects with the pharmaceutical sector have been completed or are under way. The Programme is also collaborating closely with the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Environment Programme (UNEP) with respect to certain activities, as well as with a number of centres and programmes supported by UNDP, namely, the International Laboratory for Research on Animal Diseases, the International Centre for Insect Physiology and Ecology and the Onchocerciasis Control Programme in the Volta River Basin Area. Co-operation has also been established with the Rockefeller Foundation and the Walter Reed Army Institute of Research.

3. The Programme is revieved and evaluated through the mechanisms of the Joint Co-ordinating Board, the Standing Committee, and the Scientific and Technical Advisory Committee, which have been established by the co-sponsors and the Co-operating Parties. These mechanisms are described in a Memorandum of Understanding endorsed initially by representatives of 32 Governments and the three co-sponsoring Agencies. At the p resent time, 72 WHO member countries take part in the TDR Programme, and the participation of the Governments of all Members and their institutions and scientists is promoted. It is clear from the above that the Programme has achieved truly global status, and has evoked wide interest and support among both developed and developing countries. The activities of the Programme are planned and managed by multidisciplinary groups of national scientists organized into Scientific Working Groups, each with clearly defined goals. Such Groups have been organized for each of the six diseases, and four trans-disease Programme Components. A Research Strengthening Group guides the training and institution strengthening activities.

II. The project

4. From its inception until the end of 1979 the Programme has supported a total of 804 projects, of which 602 were in the Research and Development Programme Area, and 202 in the Research Capability Strengthening Area. Of the latter, 165 were in support of training, and 37 for institution strengthening. Since 1975 more than $34 million has been obligated for direct project support, 70 per cent of which has been for research and development activities and 30 per cent for research capability strengthening. Intensive efforts have been made to involve institutions and scientists from the developing endemic countries in the implementation of the projects. The portion of the TDR operations budget obligated directly to these countries has risen from 29 per cent in 1977 to 55.4 per cent in 1979. All funds allocated for research capability strengthening go to institutions and scientists in developing countries, and approximately 50 per cent of research and development projects take place in these institutions. In addition, the great bulk of research and development work supported in developed countries involves close collaboration with developing country institutions or the training of their scientists. Following is a brief description of some of the main scientific highlights and results achieved to date.

Malaria

5. The main objectives of the work in malaria are: the improvement of existing drugs and the development and application of new ones; the development of vaccines and improvement of immuno-diagnostic tests; and improvement of methods of malaria control. High priority is being given to the clinical development of mefloquine, a promising new antimalarial drug which is effective against chloroquine-resistant strains of the parasite. Phase I and II clinical trials of mefloquine have been initiated in Latin America and Africa, and a Phase II dose-finding study is under way in South-East Asia. Progress has been made towards the development of sustained release formulations of antimalarial drugs and it is hoped that one such formulation will be available for preclinical testing in the very near future. In the area of immunology, immunodiagnostic tests have been improved, and a sensitive test is being developed for the detection of low levels of infection by the detection of malaria antigens in blood. In the area of malaria control, extensive training is being supported, and a large project on the epidemiology and control of malaria in different ecological areas in West Africa is providing important new data for use in formulating control strategies. A global effort, involving 20 countries, includes studies on alternative drug regimes, and kits for *in vitro* sensitivity testing are being produced and distributed widely.

Schistosomiasis

6. The objectives of the work in schistosomiasis are to: improve current methods of schistosomiasis control; develop or make accessible better drugs than those currently available; and study the immune responses to improve understanding of the mechanisms of the pathological processes and possibly lead to the development of a vaccine. Research is in progress on epidemiology and snail control, chemotherapy and biochemistry, immunology and basic sciences, and field research. The pharmaceutical industry is interested in the development of schistosomicidal drugs and TDR has continued to support this effort, especially through clinical

evaluation of promising new agents. In collaboration with industry, clinical trials have been carried out on a promising new drug, praziquantel, and the Special Programme is now collaborating in the field trials. In addition, the modes of action of various drugs and their metabolic pathways are being clarified, and it appears that the effectiveness of some antischistosomal drugs is dependent upon the immune response of the host. Antigenic materials are being purified for immuno-diagnostic tests and possible vaccine development.

Filariasis

7. The Scientific Working Group on Filariasis is active in three main areas: chemotherapy; immunology and pathology; and epidemiology, field research and vectors. The objectives are to: improve the use of existing filaricides and to find new ones; find means of reducing the inflammatory reactions to filarial parasites in man; identify filarial antigens for serodiagnostic tests and for possible vaccine development; and improve control of transmission in problem situations through the understanding of the vector and human components of filarial infections. Chemotherapy activities aim to improve the treatment of onchocerciasis; find and develop new drugs effective against the adult worms; and determine practical dosage schedules for large-scale treatment of lymphatic filariasis. In the search for new filaricides more than 970 compounds have been screened at the primary level, and a secondary Onchocerca screen in cattle has been developed. Mebendazole and flubendazole appear to be promising leads. Investigations into the causes and prevention of inflammatory reactions to the death of microfilariae are in progress in animal models and in man. Efforts are being made to develop in vitro and in vivo culture systems as a source of parasite antigens for improved serodiagnostic tests, and for the development of possible vaccines. Several Simulium and Mansonia vector projects have commenced. Isoenzyme studies under way indicate distinguishing features in filarial parasites that may have edpidemiological significance.

African trypanosomiasis

8. This component of the Programme deals with epidemiology, chemotherapy and immunology/pathology. The objectives are to: improve understanding of the epidemiology of African trypanosomiasis; develop simple diagnostic tests; develop new chemotherapeutic agents; improve clinical management of patients and define standard procedures of treatment; and improve tsetse fly control. A new diagnostic test card for trypanosomiasis has been developed that provides on-the-spot results in less than five minutes. The initial promising results have been readied for a major field test in West Africa. If successful, this test can be applied widely in the field by auxiliary health personnel. An appropriate combination of antigens is being sought to prepare a similar card for Trypanosoma brucei rhodesiense. A new technique for detecting low levels of parasitaemia has been developed, and important information about the effects of aerial spraying of insecticides in the control of the tsetse fly has been obtained. In addition, a major epidemiological study of T.b. rhodesiense has been initiated in north-eastern Zambia and an illustrated manual for autopsy procedures has been written in French and English and distributed to six medical facilities participating in collaborative clinical and pathological studies.

Chagas' Disease

9. Research approaches to the treatment and control of Chagas' Disease include epidemiology, pathology, and vector control; parasitology, biochemistry, and drug development; and immunology and immuno-pathology. Among the early results is a standard protocol to carry out cross-sectional and longitudinal, epidemiological studies. This is now being applied in Bolivia, Chile, Colombia, Mexico, Panama and Peru. Promising data have resulted from studies on new organophosphorus insecticides, and antitriatomid building materials in Argentina and Brazil and from a community participation-based programme for housing improvement and vector control in a rural area in Brazil. Potential trypanocides are being screened and a specific enzyme inhibitor of T. cruzi has been identified which may yield new leads for drug development. A serum reference bank has been established to develop standardized immuno-diagnostic tests and diagnostic criteria and possible murine and primate animal models are being studied.

Leishmaniasis

10. The objectives of the three research approaches in this area are: to obtain precise information on the geographical distribution, incidence, and prevalence of the human disease, and to design better methods for control; to define optimal treatment schedules using currently available drugs and develop new therapeutic compounds; and to develop better immuno-diagnostic tests and a reference serum bank. Development of a vaccine is a long-term objective. A modest drug development programme has commenced. Epidemiological projects and studies on phlebotomine sandflies have been initiated in several countries. Research is in progress on experimental immunization, and mechanisms of host resistance, and certain leishmanial antigens.

Leprosy

11. Research in the leprosy component is carried out in two main areas, namely, immunology and chemotherapy. In 1979 this component was subjected to an independent in-depth evaluation, with the conclusion that the projects supported have been highly productive. Work in the immunology of leprosy has reached a stage where the development of an effective vaccine against leprosy is a distinct possibility. Preliminary studies are being planned to obtain information which will enable a potential vaccine to be evaluated. In the area of chemotherapy the objectives are to find better ways to use existing drugs, develop new drugs, and assess national needs for new chemotherapeutic approaches. Clinical trials of combinations of drugs have been initiated in India and West Africa, using a standardized protocol. Drug development projects are under way, including the synthesis, screening and study of modes of action of compounds. Survey of prevalence of dapsone resistance are also in progress.

Trans-disease aspects

12. In addition to the above work on the individual diseases, the Programme involves research and development, training, information exchange and other activities in four areas dealing with problems applicable to all the diseases. These areas are: fundamental biomedical research aimed at developing new approaches for diagnosis, therapy,

prevention and control; vector biology and control; epidemiology; and social and economic research. One result achieved has been familiarization of scientists, working in the basic biomedical sciences, with the goals of the TDR Programme, and the provision of information regarding relevant progress in biomedical science to those working on specific target diseases. In the area of vector biology and control the most significant progress thus far has been the promising results obtained with a spore-forming bacterium, serotype H-14 of Bacillus thuringiensis, in the biological control of mosquito and blackfly larvae. Epidemiological training is being improved, and protocols for analytical epidemiological studies on malaria, schistosomiasis and trypanosomiasis are under development. Social and economic research is contributing to the development of guidelines for resource allocation decisions.

Research capability strengthening

13. The concept of the Special Programme is based upon the greatest possible participation of the affected tropical countries. It will be through their efforts that the diseases will ultimately be brought under control. They are involved in research at all levels, not solely in those activities which of necessity must take place in endemic regions, as for example, epidemiological and operational research and the evaluation of new drugs, vaccines and diagnostic tests. The Programme therefore stimulates these countries to assume an ever increasing role in the research required to identify, analyze and solve their health problems, and provides assistance to enable them to fulfill this responsibility, through institutional support and a programme of research training to complement it. In 1979, 75 research training grants, 7 re-entry grants, and 15 visiting scientists grants were awarded, and 10 group training activities were supported. In addition, 19 institutions received various types of support ranging from one-time capital grants to long-term programmes of support. All such awards are made to institutions and trainees of the developing endemic countries, and all research strengthening activities are developed in close collaboration with national authorities in the context of their needs and resources. The ultimate objective is to establish a network of collaborating institutions in tropical endemic countries.

14. While the accomplishments of the Special Programme to date are impressive, it must be recognized that the work has barely begun, and that the eradication of the six target diseases will be a long-term endeavour of perhaps 15 to 20 years. The strengthening of the research capabilities of the affected countries can be achieved only through sustained co-operation with the national authorities, and development and application of new and improved technologies for the control of the diseases will also take many years. The co-sponsors of the Programme and Co-operating Governments and Agencies understand and accept these facts. It is recognized that the achievement of the objectives established for the Programme, although costly, will contribute substantially to human well-being and the possibility of health for all by the end of the century. The Administrator attaches the highest importance to the attainment of that goal, and considers that UNDP should continue to support the Special Programme during the third Indicative Planning Figure (IPF) cycle. UNDP support will continue to be provided to the Programme as a whole, without being earmarked for any particular component of the Programme. It should be noted that the contribution herewith recommended will commence only in January 1983, since the present allocation approved by the Council at its January 1978 meetings was for the five-year period 1978-1982 inclusive. The recommendation is being submitted to the

Council at its present session because a system of biennial budgeting has recently been adopted by the co-operating parties, and UNDP, as a principal co-sponsor, should be legally enabled to pledge for the years 1982 and 1983 at the next pledging session, which will take place towards the end of 1981.

15. The components of the proposed UNDP inputs are as follows:[a/]

Subcontracts	$7 507 300
Miscellaneous	60 000
	$7 567 300

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a/ Since UNDP is a co-sponsor of the TDR Programme, no agency overhead costs will be charged to this project which forms part of the UNDP/WHO/World Bank Special Programme for Research and Training in Tropical Diseases.

III. Recommendation

16. The Administrator recommends that the Governing Council:

(a) Approve UNDP assistance to this project; and

(b) Authorize the Administrator to make the appropriate arrangements with the Executing Agencies for the execution of this project.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

International Centre of Insect Physiology and Ecology - Development of Long-range Means of Control of Crop and Livestock Pests and Diseases (GLO/81/004)

Estimated UNDP contribution:	$7 925 000
Duration:	Five years
Executing Agency:	UNDP

I. Background

1. The International Centre of Insect Physiology and Ecology (ICIPE) was established in Nairobi, Kenya, in 1970, at the initiative of a group of eminent entomological scientists, to provide a resource base for fundamental studies on the physiology and ecology of insects of world-wide economic importance. ICIPE fulfils two major functions: (a) it is creating an institution unique in its cultural, educational and scientific aspects, where a diversity of scientific talent from developing and developed countries can pursue advanced research under the guidance

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of eminent scientists, making maximum use of the natural and human resources of developing countries: (b) the knowledge and experiences of ICIPE will provide basic knowledge of the biology of several groups of pests important in many developing countries. Such knowledge is essential to permit these countries to develop practical integrated pest control systems which will minimize the economic damage of insecticide residues on human populations and their environment.

2. Since 1972, UNDP has been assisting ICIPE in its research and training programmes. In January 1973, the Governing Council of UNDP approved a five-year project for this purpose with an earmarking of $3,164,900.1/ In January 1977, the Governing Council approved additional financial assistance for a second phase of operations over a further five-year period at a cost of $4,529,000.2/ Subsequently in January 1978, the Governing Council approved a supplementary allocation of $260,000 to be used towards the construction of a training hostel at ICIPE.3/ The objective of the UNDP project at ICIPE is two-fold: (a) to carry out basic and applied research on critical aspects of insect physiology and ecology required for the development of environmentally sound and effective biological pest control systems, as an alternative to often harmful chemical insecticides; and (b) to train developing country scientists and technicians in the afore-mentioned disciplines.

3. The research under the UNDP project is concentrated on the following major pests that affect crop and livestock and in some cases human beings: tsetse flies; African armyworms; mosquitoes; ticks; foraging termites; sorghum shoot flies; cereal stem borers; and grain legume pod borers. From the foregoing description, it is evident that the work of ICIPE, which is being financed by UNDP, supplemented by contributions from a group of other donors, transcends the boundaries of research on human, animal and plant pests and diseases. In the last eight years, ICIPE has grown into a first-class scientific research institution, internationally recognized and respected. While many of the pests and diseases problems have been the object of practical eradication and/or control measures by various national, regional and international organizations for several decades, no simple methods of control are available. Therefore, ICIPE has had to adopt a different strategy to what appear to be intractable pest problems. First, it has brought together, within a single intellectual and scientific environment, a multiplicity of disciplines and specializations (many of which were not traditionally associated with entomological research) - plant host-insect relations, sensory physiology, chemical communication pheromonal physiology, epidemiology, insect immune mechanisms, basis of plant resistance to insect attack, insect population modelling, insect pathology, as well as the more traditional entomological studies - all concentrating on the target species, in an attempt to make breakthroughs which would lead to novel pest management technologies without the already known drawbacks of chemical approaches to insect control. Second, it has adopted an open strategy for each of the target insects: in each case, ICIPE is exploring lines of study which hold promise as new avenues for pest management. Third, while not neglecting short-term tactics for pest control, it has not felt it compelling to devote most of its resources to fire-fighting efforts which might result in short-term control of pest outbreaks.

1/ DP/PROJECTS/R.2/Add.4.
2/ DP/PROJECTS/R.17/Add.1.
3/ DP/PROJECTS/R.9/Add.6.

4. Important discoveries have been made by ICIPE in the last eight years, and these relate to: the reproductive physiology, isolation mechanisms, sensory physiology and genetic variability of the various insects involved and ecological influences on their behaviour; development of non-chemical control of pests and diseases, giving special attention to the small, resource-poor farmers; and investigations into the use of naturally occurring substances as pesticides. These discoveries are indeed of vital strategic importance for the development of biological methods of control, not only of pests which threaten food crop production, but also of those insects which are major vectors of tropical diseases in developing countries. As an integral part of the UNDP project, large numbers of developing and developed country specialists are being trained at ICIPE in all of the afore-mentioned fields. Illustrative examples of ICIPE's discoveries of considerable practical significance to agriculture are: (a) livestock ticks research which can provide data relevant to a practical integrated solution to tick-borne diseases of livestock; (b) crop borer and sorghum shoot fly research integrated with plant resistance to insect attack which demonstrates that sorghum plants taller than 20 centimetres are not attacked by sorghum shoot flies, a devastating pest; (c) results emerging from research on armyworm, medical vectors, tsetse flies and termites, which are providing important leads of practical significance.

5. The ICIPE research programmes are closely linked with the work of such international centres as the International Laboratory for Research on Animal Diseases (ILRAD), the International Institute of Tropical Agriculture (IITA), the International Rice Research Institute (IRRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Maize and Wheat Improvement Centre (CIMMYT), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization's (WHO) Tropical Diseases Research Programme, the West African Rice Development Authority (WARDA) and a number of national institutions in both developing and developed countries.

6. While the UNDP project has made steady progress and is receiving enthusiastic moral and financial support from UNDP, the Government of Kenya and a group of outside donors, it is evident that in view of the long-term nature of the investigations presently under way, some of which will require sustained support before payoffs can be expected, a long-term commitment of financial support to ICIPE is needed from all concerned external donors. In view of the fact that the current UNDP project at ICIPE is scheduled for completion in December 1981, ICIPE has approached UNDP for follow-up assistance for a further five-year period.

7. The results and accomplishments of ICIPE were critically evaluated in December 1980 by a UNDP commissioned consultant mission consisting of two prominent scientists. This mission, in speaking very favourably of the progress of the UNDP project at ICIPE as a whole, strongly recommended the continuation of UNDP assistance for a further five-year period to consolidate current work and to expand and intensify research and training in key areas which have shown promise. The UNDP Administrator's advisory panel on the global programme, at its first meeting held in January 1981, endorsed further UNDP support to ICIPE and observed that the work of ICIPE would be an extremely important input in the development of pest management policies and techniques. Realizing the importance of ICIPE research activities to the solution of pest management problems of tropical countries of the developing world, a number of bilateral and multilateral donors have been providing financial support which is

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steadily broadening. UNDP support to ICIPE during 1972-1977 amounted to approximately 60 per cent of the total resources made available by all donors, and this proportion has now decreased to 20 per cent. Thus, UNDP has been instrumental in marshalling financial assistance to ICIPE from a number of donors. In order to assure continuity of the magnitude of financial support needed over the next several years, arrangements are presently under way to establish a consortium of interested bilateral and multilateral donors in order to secure a more stable and long-term financial support for ICIPE. The World Bank has agreed to provide secretariat services for the consortium and to act as its fiscal agent.

II. The Project

8. The general objectives of the project are to:

(a) Continue to seek new knowledge that will lead to the development of long-range, effective and environmentally-acceptable pest management techniques;

(b) Continue to collaborate closely with the international agricultural research centres, and to strengthen the co-operative linkages of ICIPE with the national programmes in tropical countries and applied research institutions, in order that ICIPE research results can be incorporated effectively into experimental and pilot schemes for pest control; and

(c) Assist in building up the human resources in the field of pest management research and practice in Africa and other tropical regions by its programme of training and study workshops.

9. Project activities will be concerned primarily with research into crop pests, and also with research support services and training. Specific topics of research are as follows:

A. Bases of plant resistance to insect attack

10. The use of insect resistant food crops will be a key component of a comprehensive crop pest management programme, which will be implemented in close collaboration with international agricultural research centres such as IRRI, ICRISAT, IITA and CIMMYT. Major lines of investigation will include: field screening of breeding materials of crops at the ICIPE field station at Mbita Point to determine the resistance of specific crops to target insect pests; studies on physical and chemical factors affecting plant resistance, including the isolation and identification of the chemical compounds involved; genetic studies on the inheritance of resistance in order to understand genetic factors controlling resistance to insects; and genetic and physiological mechanisms responsible for the breakdown of resistance in plants when new insect biotypes are formed. Current work involving the above investigations on stem borers of maize, sorghum and cowpeas, which are major food resources in Africa, will be intensifed in an effort to obtain quick results to benefit subsistence farmers. Studies on the rice brown plant hopper, which would have application primarily to Asia, will be continued in collaboration with IRRI.

B. Investigations on crop borers

11. These studies will focus on four target species of insects which attack cowpea, maize, sorghum, millet and rice, causing considerable crop losses. The sorghum shoot fly, for example, can destroy 80 per cent of the crop. Investigations will include: assessment of crop losses, study of the biology, ecology and behaviour of the pests, crop/pest relations, seasonality, offseason survival, etc.: identification of weak links in the life-cycles and biology of the pests; insect/host interactions under intercropping systems; and identification of natural disease organisms (insect pathogens) and parasites and predators of the target pests.

12. The above research, which will be conducted in close co-operation with IITA, ICRISAT, IRRI, WARDA, CIMMYT and the FAO Regional Programme in Kenya, is expected to result in technology to minimize damage due to the pests concerned and to develop capabilities of national personnel of African countries and other tropical countries in the relevant control techniques. Since the crops mentioned above provide more than 50 per cent of the food energy of the subsistence farmers, pest management strategies to control the crop borers affecting these crops would be of great economic significance.

C. Research on African armyworm

13. The African armyworm is a major pest in countries of eastern and southern Africa and in the Yemen region of the Arabian Peninsula. It mainly attacks grasses but also cereal crops such as maize and sorghum. The devastation it causes is primarily due to its unpredictable appearance and the rapid development of outbreaks. Other damaging armyworm species are known to occur in other parts of the tropics. In the last seven years, ICIPE has conducted basic research on the biology, feeding, mating and reproduction of the armyworm. This work has been carried out in close co-operation with the monitoring and forecasting of armyworm migrations undertaken by the Desert Locust Control Organization for East Africa, the Kenya Agricultural Research Institute (KARI) and the Centre for Overseas Pest Research of the United Kingdom. Further research on armyworm at ICIPE will include the following topics: survival of armyworms during adverse seasons; behaviour of gregarious and solitary phase caterpillars in the field and laboratory; marking techniques for tracing movement of armyworm moths; and ecology of the virus disease of armyworm caterpillars, which can be a key mortality factor.

14. The above programme, which has suffered from inadequate resources, will be revitalized in the present project in order to apply practical results as widely as possible.

D. Work on grassland termites

15. In the past five years, ICIPE has demonstrated that grassland termites can forage as much plant material as livestock and game animals put together. This finding has major implications for the management of the fragile pastures in the semi-arid areas of tropical Africa. It has also been found that termites play an important role in soil development and in recycling soil organic matter, thereby improving the soil structure and soil fertility. Further work on termites will be concentrated on the quantitative assessment of their role in the above-mentioned areas and on devising means to control harmful termites under stressful environmental

conditions, while encouraging beneficial ones. Specific research will be conducted on: (a) nitrogen utilization, the nutritional significance of fungus culturing by the termites, ecological preferences and competition, predation and pathology; and (b) colony structure and composition, amounts of food consumption, biomass, mound density and area, mound ages, laboratory techniques on the physiology of caste differentiation and trail-laying behaviour, which is controlled by chemicals called pheromones in the termites.

E. Livestock ticks research

16. A large number of tick species feeds on domestic livestock (cattle, sheep, goats, donkeys, etc.), causing anaemia and the transmission of a variety of harmful and debilitating diseases to human beings. Most of these diseases occur in Africa and are not very amenable to chemotherapy. Present methods of tick control which involve dipping the animals in pesticide solutions are unsatifactory because of their toxicity, the chance of inducing pesticide resistance in the ticks, the high cost and the chance that the solutions will leave dangerous residues in animal products. Future lines of ICIPE research on ticks will include: the immune response of host animals, to determine differences in resistance to ticks; introduction of resistance to ticks in cattle through the development of suitable antigens; and the physiology and ecology of ticks, to facilitate the possible development of an integrated, environmentally sound methodology for the control of ticks and tick-borne diseases.

17. The above research programme will be carried out in close co-operation with ILRAD and KARI.

F. Tsetse research

18. Trypanosomiasis is one of the major parasitic diseases in Africa south of the Sahara. It affects human beings, causing sleeping sickness; in animals, the disease is called Nagana. The disease, which is transmitted by tsetse flies, causes poor performance and death. Tsetse fly and trypanosomiasis research at ICIPE is aimed at studying the important phases of the life cycle of the fly, as well as the phases of development of the trypanosome parasites within the fly and mammalian hosts. The research studies the interrelations of three components, namely: vertebrate hosts, invertebrate vectors and trypanosomes. The aim is to find a new and effective measure to disrupt the transmission of the disease and to help in the planning of co-ordinated control strategies. The programme involves a number of specialized disciplines and consists of three research projects: tsetse reproductive physiology; tsetse ecology and trypanosomiasis epidemiology; and trypanosome vectors physiology. Research activities are performed at ICIPE headquarters in Nairobi and in the field. The support units interact with the programme by providing significant inputs into fundamental studies related to tsetse physiology and to the biology of the trypanosomes. Co-operation is presently going on with the former East African Trypanosomiasis Research Organization in Tororo, Uganda, the recently established Kenya Trypanosomiasis Research Institute, the Tsetse Research Laboratory in the United Kingdom and with IAEA, FAO, WHO and ILRAD. The mandate of ILRAD is to thoroughly investigate immunology in trypanosomiasis in the hope of developing a vaccine to protect cattle against this disease.

19. The current work of ICIPE in the field as well as in the laboratory on tsetse ecology, epidemiology, reproductive physiology and trypanosome tissue culture immunology has yielded significant results, thereby raising the possibility of control systems. These programmes will be intensified in collaboration with the institutions mentioned above and, in particular, with ILRAD.

G. Medical vectors of tropical diseases

20. Africa and other parts of the tropics are afflicted with several major diseases in human beings. Three of the important diseases are malaria (caused by mosquitoes), bancrofti filariasis (filarial worms which infect human beings and cause blindness or general ill health) and leishmaniasis (referred to a heterogeneous group of diseases ranging from sores on the skin to fatal diseases caused by parasitic organisms which are probably transmitted in the same way as trypanosomes). These diseases have a seriously disabling and sometimes mortal effect on human beings. ICIPE research on these diseases includes studies in: ecology, population dynamics, physiology, vector behaviour, insect-parasite relationships and the identification of reservoir animals. Pathogens and parasites affecting the disease organisms are being studied to develop environmentally acceptable methods of control. These studies will be continued with appropriate shift in emphasis and implemented in close collaboration with the WHO/UNDP Special Programme on Tropical Diseases Research and Training, research institutions in France, the Ministry of Health of Kenya and the Medical Faculty of the University of Nairobi.

21. The various programmes described above are integral elements in the overall research programme of ICIPE. Parts of specific components are financed by other donors. In the case of each of the above-mentioned activities, the assistance requested from UNDP is meant for the basic support required to enable ongoing research to be continued and broadened. Supplementary assistance is anticipated from other sources.

Research Support Services

22. ICIPE currently operates four support research units for chemistry and biochemistry, histology and fine structure, sensory physiology, and bioassay. In addition, the following units have been established: insect and animal breeding; field stations (Mbita Point, Muhaka and Kajiado); outreach management; workshops (electronic, mechanical, woodworking, glass-blowing, etc.); laboratory management; and library and documentation. Some of the laboratories listed above are reasonably well-equipped, with modern scientific apparatus and equipment which are playing a significant role in fundamental and applied research at ICIPE. Items of equipment now requested from UNDP will supplement those already available and will be used to meet specific needs of the research programmes enumerated above. None of the funds requested from UNDP will be used for capital costs.

Training

23. ICIPE has given the highest importance to training at all levels which incorporates scientific, technical and managerial elements. Several schemes are available to achieve the training objectives, with greater opportunities being given to scientists from developing countries. These are: research associateships for gifted young scientists; post-doctoral research fellowships; graduate research

scholarships; science bursar scheme to enable bright high school students to obtain a six-month work experience at ICIPE; professional technical and administrative staff training programmes for ICIPE staff; language training (French, Swahili and English); ICIPE/UNEP training course in integrated pest management; study tours and overseas study leaves; and workshops and seminars. In the last eight years, over 260 man-years of training have been imparted in the afore-mentioned areas. Participants from 55 countries have attended ICIPE workshops. The UNEP/ICIPE training course has been attended by participants from 27 countries. The availability of new and expanded hostel facilities, which were constructed with financial assistance from UNDP, the Special Fund of the Organization of Petroleum Exporting Countries (OPEC) and the United Kingdom, makes it possible for a greatly enlarged training programme to be undertaken by ICIPE. During the next phase of UNDP support, a major expansion of the various training programmes is projected, with wider geographic representation including Asia and Latin America. While the funds requested from UNDP for training will be used largely for specific training programmes, the bulk of the major expansion of training planned during the next 3-4 years will be financed by other donors.

24. A review of all of ICIPE programmes of research and training is made each year at the annual research conference in June when practical and urgent questions of pest control receive the careful attention of scientists. This assessment is made crucial by the participation of the ICIPE consultants, collaborators and scientific representatives of the UNDP and international and African agencies and institutions with particular interest in the work of ICIPE. Additionally, in order to assess and advise ICIPE on its programmes of work, particularly as to the emphasis to be given to research, training and demonstration activities during the project period, each year ICIPE will invite representatives of UNDP, UNEP, the specialized agencies of the United nations family, donor agencies, African scientific institutions and the international research centres to participate in the open meetings of the ICIPE Governing Board and its Programme Committee, as it deems appropriate.

25. Midway in the course of the project, UNDP, in consultation with ICIPE, might decide to schedule an evaluation of project activities to be undertaken by a team of 2-3 independent consultants. Such an evaluation, if needed, could be undertaken in conjunction with an annual ICIPE research conference referred to in paragraph 24. In any event, towards the completion of the project, a thorough evaluation of project results and accomplishments will be mounted by UNDP in consultation with ICIPE, to be carried out by independent and prestigious consultants.

26. The expenditure component of the proposed UNDP contribution is:

	US$
Subcontract	$7,725,000

27. The expenditures under the project will be contained within the Indicative Planning Figure established by the Governing Council for global projects.

III. Recommendation

28. In the light of the above, the Administrator recommends that:

The Governing Council,

(a) Approve this project; and

(b) Authorize the Administrator to make appropriate arrangements with ICIPE for the execution of this project.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

International Centre of Insect Physiology and Ecology - Development of Long-range Means of Control of Crop and Livestock Pests and Diseases
(GLO/81/004)

Corrigendum

Page 8, paragraph 26 should read:

26. The expenditure component of the proposed UNDP contribution is:

	$
Subcontract	7,725,000
UNDP Direct Costs	200,000
Total	7,925,000

* This document will be derestricted upon approval of the project. See document DP/526 which will be issued in June 1981.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Supplementary assistance for a global project

Testing and Demonstration of Small-Scale Solar-Powered Pumping Systems (GLO/78/004)

Estimated UNDP contribution:	$1 250 000
Duration:	12 months
Executing Agency:	World Bank

I. Background

1. The Governing Council at its twenty-fifth session in June 1978 approved $1,176,105 for the global project, Testing and Demonstration of Small-Scale Solar-Powered Pumping Systems. 1/ Supplementary assistance for the project in the amount of $45,000 was subsequently approved by the Council at its twenty-seventh session in June 1980. 2/ When the latter allocation was approved, it was expected that the present phase of the project would be completed under it, and that a second phase, extending project operations to a larger number of countries, would be ready for submission to the

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* This document will be derestricted upon approval of the project. See document DP 1526 which will be issued in June 1981.

1/ DP/PROJECTS/R.10/Add.1.

2/ DP/PROJECTS/R.13/Add.3.

Council at its twenty-eighth session. Following a comprehensive review of the project and the results achieved to date, the Administrator has decided that a one-year extension of the current phase is desirable to permit more thorough planning of the second phase project, and to investigate the feasibility of broadening the scope of the next phase to include testing and demonstration of other renewable energy technologies.

2. The basic objective of the current project has been to develop, drawing upon existing technologies to the maximum extent possible, small-scale pumping systems for irrigation and drinking water supply which: (a) utilize solar power as their energy source; (b) are sufficiently low-cost for adoption by small farmers and village communities; (c) have simple operation and maintenance requirements; and (d) have good prospects for manufacture and/or assembly in developing countries. Eleven pumping systems that give promise of meeting the above criteria are currently undergoing field testing and comprehensive monitoring in three countries, namely, Mali, the Philippines and Sudan. Ten of the systems are photovoltaic, and one is thermal. In addition, data have been gathered on additional solar thermal units undergoing tests at manufacturers' sites in India, Israel, Italy and the Federal Republic of Germany. Intensive laboratory testing of corresponding subsystems in the United Kingdom and the United States of America have also been carried out.

3. The project represents the most systematic effort to date to monitor rigorously the performance of solar pumps under field conditions in different geographical and agricultural areas. Project activities have produced a great deal of valuable and hitherto unavailable information that will assist in the design of improved systems realistically adapted to developing countries' requirements. Based on data presently available, a start has been made on improved system design studies as well as on a computer model which will be used as a design guide in matching the various components of the pumping system to ensure optimum operation for a particular site. To complete the data base, some of the units that arrived in the field most recently should be subjected to further testing and monitoring; and some others should be shifted from their present locations at collaborating research laboratories in the participating countries to actual farm sites. Finally, before the parameters of the second phase project are fully decided upon, the state-of-art review carried out at the beginning of the project should be up-dated to take account of the technological developments in solar-pumping that have taken place over the past two years. The proposed one-year extension will also offer an opportunity to consult in depth with additional developing countries interested in participating in the next phase of the project.

4. It is suggested that the scope of the project be broadened in its next phase to include work on renewable energy technologies other than solar water pumping. Important as the latter is, developing countries face a variety of energy needs in numerous sectors and the potential contribution of different renewable energy technologies, including other solar devices, merits intensified exploration. There appear to be few countries in the developing world today that do not have renewable energy programmes of some sort under way, and several donors have made support for

such programmes a high priority. These programmes consist largely of R and D type of activities, linked with testing. While much useful work is certainly being done, the effort world-wide is fragmented and dispersed over many countries and institutions, most of which are working at a sub-critical level with insufficient provision for the dissemination and exchange of results. There is also risk of considerable duplication among them. The forthcoming United Nations Conference on New and Renewable Energy Sources seems certain to generate further interest. It is becoming increasingly urgent, therefore, to obtain a more comprehensive view of the work that is currently under way on various renewable energy technologies to determine how efforts may be strengthened and better co-ordinated, and existing gaps filled. The critical area is in the field of testing and demonstration. With few exceptions, renewable energy technologies exploit energy resources and scientific and engineering principles that have been long understood. However, the details of equipment design and site selection, which are often crucial to applications that will be technically and economically successful, are difficult to specify in advance. Field testing and demonstration is therefore a critical step in moving new energy technologies from the laboratory into the hands of developing country users. During the extension of the present project, it is accordingly proposed to review the work that is currently under way on various renewable energy technologies, and make recommendations for significantly strengthening the worldwide testing and demonstration effort.

II. The project

5. The principal objective of the proposed 12-month extension of the project is to prepare the way during the third programming cycle for an expanded programme for the testing and demonstration of small-scale solar pumping systems meeting the criteria referred to in paragraph 2 above. This will be accomplished by: (a) continuation of the current testing programme for the purpose of obtaining more complete and comprehensive data; (b) use of the data acquired to redesign systems; (c) procurement and testing of a few improved prototypes for drinking water supply as well as irrigation applications; (d) selection of additional countries interested in participating in the project, through field missions designed to discuss with Governments their small-scale pumping requirements and technical and institutional capacity to collaborate effectively in the project; and (e) further investigation of the technical and economic potential for solar pumping and the potential for local manufacture. These activities are expected to result in detailed recommendations for a second phase project to be submitted to the Governing Council at its June 1982 session.

6. A second objective of the proposed extension is to investigate ways of strengthening, supplementing and better co-ordinating the testing and demonstration work currently under way in many countries on various renewable energy technologies. Emphasis will be placed on low-level technologies suited to the needs of rural areas and traditional sectors of the economy. Renewable technologies meeting these criteria include wind pumpers, biogas (anoerobic digestion), gasification of biomass, crop dryers, wood-burning stoves, solar cookers, and small hydroelectric plants. This list is not meant to be exhaustive, and relative priorities among the various categories are under further study.

7. Under this component of the project, a series of state-of-the art studies will be carried out that will comprise: (a) a review of testing and demonstration work currently under way in each technology; (b) an assessment of the near- or medium-term readiness of the technology for developing country applications; (c) an assessment of the need for further testing and demonstration as a means of accelerating the development or application of the technology; and (d) where further field testing is indicated, recommendations for the design and scope of a suitable programme. In implementing this component of the project, the World Bank will consult closely with other agencies of the United Nations system and draw upon their expertise with reference to those technologies in which a given agency may have special experience or competence.

8. The expenditure components of the proposed supplementary assistance are as follows:

	$
Personnel	440 000
Subcontract	650 000
Training	100 000
Miscellaneous	60 000
Total	1 250 000

The proposed UNDP contribution for the second half of 1981, estimated at $330,042, will be contained within the Global Indicative Planning Figure (IPF), established by the Governing Council for the current cycle, and the balance within the Global IPF established for the third cycle.

III. Recommendation

9. In the light of the above, the Administrator recommends that:

The Governing Council,

(a) Approve the proposed supplementary assistance; and

(b) Authorize the Administrator to make the appropriate arrangements with the World Bank for the extension of the project.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

Research and Development in Integrated Resource Recovery (GLO/80/004)

Estimated UNDP contribution:	$1,866,000
Duration:	Three years
Executing Agency:	World Bank

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* This document will be derestricted upon approval of the project. See document DP/526, which will be issued in June 1981.

I. Background

1. Management and disposal of urban waste is assuming increasing importance in many developing countries, as a consequence of the rapid urbanization process now prevailing in most parts of the world. Increasing costs of refuse collection and disposal now amount to as high as 20 per cent of municipal budgets of some developing country cities, and are likely to increase steadily. Unless properly managed, urban waste can pose serious threats to the environment and to individual health. When properly managed, urban wastes represent significant potential sources of reusable materials and energy, and resource recovery is receiving increasing attention within waste management programmes, in developed and developing countries alike. This trend is likely to continue as the demand for, and cost of, raw materials of all kinds continues to grow. As a result of these factors, there is a growing recognition that improved methods of waste management in developing countries are an increasingly urgent need. A recent example of this recognition is the Workshop on Solid Waste Disposal and Utilization in Developing Countries, organized in Amsterdam in October 1980 with the support of the Government of the Netherlands, and which was attended by representatives from nine developing countries. The Workshop unanimously adopted a resolution calling for the improvement of scientific knowledge and increased exchange of information and experience in this sector.

2. The problem of devising better waste management systems that will meet acceptable economic, environmental and health standards is complicated by the fact that present systems are a significant source of employment for urban populations. It is estimated that in many cities of developing countries 1 to 2 per cent of the population is supported directly or indirectly by refuse from the upper 10 to 20 per cent of the population. In large cities with a population of 3 to 10 million persons this represents a significant number of jobs. Estimated household incomes from scavengers range from minimum poverty levels in some countries to approximately three times the average urban income in one large city. Present systems frequently provide the only entering level of employment for new urban dwellers emigrating from rural areas. In these circumstances, it is essential that improved waste-management systems build upon present systems to the extent possible, so as to minimize the disruption of present employment patterns. Appropriate occupational health and safety measures need to be incorporated to safeguard and improve the scavengers' working conditions, which are generally very poor and detrimental to health.

3. In order to design better waste management and recovery systems and optimize investments in this sector, additional research is needed. It is necessary, first of all, to obtain more complete data on the financial, employment, environmental and social aspects of present entrepreneurial and municipal systems. Social aspects need particular attention, since present systems of waste collection, recycling and disposal are frequently a complex function of culture, education, religion, social status and related factors. In order to design appropriate systems it is necessary to understand which behavioural elements can be changed during the lifetime of a project, and which cannot. Research and experimentation on multipurpose systems is needed; i.e., systems that combine waste collection,

sorting, recovery and recycling for alternative uses into an efficiently integrated operation. Present difficulties in identifying and quantifying the many variables and interactions involved in such systems have generally led in the past to single purpose approaches to resource recovery, whereas multipurpose systems can offer many advantages. Finally, expanded research is needed into the possibilities for converting waste materials into usable sources of energy. Possibilities here include, among others, direct recovery of energy through combustion or methane production; conservation of equivalent amounts of energy through the recycling of metals, glass, paper and plastics; and composting of city waste to produce fertilizer for horticulture and agriculture in adjacent areas.

II. The project

4. The immediate objective of the project is to carry out research on the above questions for the purpose of designing and installing pilot integrated resource recovery systems in six developing country cities initially. The longer-term objective is to achieve significant economic, health, environmental, employment and energy benefits for developing countries through the development and demonstration of replicable integrated resource recovery projects that meet acceptable economic, environmental and social standards. The six cities to be included in the project have not yet been selected. Preparatory work has been initiated for the purpose of defining criteria for city selection and exploring with Governments their interest and role in the project. The project document, including a detailed work plan, will be formulated in consultation with interested Governments and Agencies during the preparatory period. To finance the necessary preparatory work, the Administrator has approved an amount of $100,000 under the authority delegated to him by the Governing Council for the purpose of preparing global research projects.

5. The research to be carried out is expected to include such topics as the following:

(a) A review of historic practices of waste collection, disposal and recovery in industrial countries;

(b) Case studies in six cities of developing countries aimed at documenting the technological, institutional, economic and social aspects of current systems;

(c) Institutional and social determinants of the quantities and composition of household, commercial, industrial and community refuse at various levels of development;

(d) Cultural, social and institutional constraints and thresholds which determine the economic status of employers, workers, and entrepreneurs in waste collection, recycling and disposal;

(e) Employment and income levels and potentials for single-purpose and integrated systems of resource recovery;

(f) Applicability to specific locations of alternative labour and capital-intensive schemes for resource conservation and recovery, and for related waste disposal;

(g) Recoverable energy values for mixed or sorted refuse and equivalent energy values for various components of that refuse, such as metals, glass and plastics;

(h) Local marketing channels and values of recoverable materials;

(i) Cost savings to municipalities which may be realized by recycling waste rather than disposing of them.

The scope of the research is subject to modification on the basis of further investigations to be carried out during the preparatory period.

6. On the basis of the research to be conducted, policy option and planning guidelines for single purpose and integrated systems will be formulated, and six demonstration-scale integrated resource recovery projects will be designed and organized in the cities selected for inclusion in the project. Each system will be adapted to the specific economic, social and environmental conditions prevailing in the city in question. Methodologies and protocols for monitoring these projects and other existing and proposed resources recovery and waste disposal programmes will also be developed. Cities will be selected and demonstration projects designed in a way that will yield experience in a variety of climates, cultural situations and economic conditions, based on a range of waste sources and reclaimed products.

7. Interim and final research results will be disseminated widely. In the fin year of the project, workshops will be organized to familiarize concerned officials of developing countries with the conclusions drawn from the research work and demonstration projects. Final results will be incorporated in a manual of practice, synthesizing the project's findings and recommendations regarding alternative technologies of waste management and resource recovery, occupational health and safety, market development for reclaimed products and institutional a investment requirements of alternative systems.

8. The expenditure components of the proposed UNDP contribution are at this ti expected to be approximately as follows:

	$US
Personnel	1,221,000
Subcontract	120,000
Equipment	300,000
Training	120,000
Miscellaneous	105,000
Total	1,866,000

/.

This expenditure pattern is subject to revision and will be finalized on the basis of the research design and work plan to be formulated during the preparatory period. Proposed expenditures during the year 1981, estimated at no more than $200,000, including the preparatory assistance already approved, will be contained within the global IPF for the current cycle, and the balance within the global IPF established for the third cycle.

III. Recommendation

9. The Administrator recommends that the Governing Council:

(a) Approve the project; and

(b) Authorize the Administrator to make appropriate arrangements with the World Bank for its implementation.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) - West African Sorghum and Millet Improvement Programme (Phase III) (GLO/81/002)

Estimated UNDP contribution:	$5 900 000
Duration:	Five years
Executing Agency:	UNDP

I. Background

1. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) was constituted by the Consultative Group on International Agricultural Research (CGIAR) in 1972 with a view to improving the yields of five principal crops (namely, sorghum, millet , chick-peas, pigeon-peas and ground-nuts) in the semi-arid tropics which cover a wide belt of Asia, Africa, Latin America and Australia. These crops are grown in a harsh environment of depleted soils, erratic rainfall and sparse or no irrigation by small farmers with very limited resources. ICRISAT has a special

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mandate for research in farming systems, socio-economic constraints and transfer of technology for the seasonally dry semi-arid tropics in order to catalyze a breakthrough in the agricultural production of the region.

2. From its inception, ICRISAT has been receiving substantial assistance from UNDP for the improvement of sorghum and millets which are grown extensively in the semi-arid tropics as staple food crops because they are able to withstand dry conditions. To date, UNDP assistance amounting to over $13 million has been effectively utilized for research on these two crops, mostly at the ICRISAT headquarters in India, although in the last five years considerable resources have been channelled to a co-operative programme in selected West African countries. A three-year first phase of this programme, with an earmarking of $2,495,000, was approved by the Governing Council at its nineteenth session in January 1975.1/ Subsequently, at its January 1978 meeting, the Governing Council approved a second phase of assistance for a further three-year period in the amount of $3,180,000.2/ Even though ICRISAT is relatively young, it has made major advances in the collection and exchange of germplasm of the crops concerned and in the screening, testing and breeding of these crops for resistance to pests, diseases and environmental stresses. Many of these techniques are already being used extensively in India and Africa.

3. The UNDP/ICRISAT African Co-operative Programme which began in January 1975 is a vital companion piece to basic research on sorghum and millets being carried out at ICRISAT headquarters in India with substantial UNDP financial assistance since 1972. The main objective of the African Co-operative Programme, which was conceived soon after the Sahel drought, is to: (a) co-operate with and strengthen existing West African agricultural research programmes to develop higher-yielding varieties of sorghum and millets and to introduce appropriate technologies to achieve consistent and reliable yields; and (b) to train large numbers of national personnel in all aspects of production and research on sorghum, millets and companion crops as well as in related areas of farming systems to make maximum use of available soil, water and other resources.

4. Initially, the project covered 12 countries from Senegal to Chad, including nine French-speaking and three English-speaking countries. In 1977, Sudan was included in the project, following a request from that country's Government for technical assistance. Implementation of the project has proceeded steadily. Initial problems of logistic support and formulation of acceptable agreements were overcome with the assistance of the UNDP Resident Representatives in each of the co-operating countries. The main co-operating station for the project is at Kamboinse near Ouagadougou, Upper Volta. To date, considerable progress has been made in co-operative testing on sorghum and millets related to varietal testing and farming systems research in association with other crops under different management practices. Local germ-plasm of sorghum and millet has been collected and evaluated and exotic germ-plasm has been introduced and distributed to co-operating countries. Some promising results with sorghum have been achieved. Sources of disease resistance in millet have been identified. Good co-operation has been developed between ICRISAT and national scientists in all countries. Large numbers of personnel from the co-operating countries have received training at varying levels, mostly at ICRISAT headquarters and also on the job in West Africa.

1/ DP/PROJECTS/R.3/Add.2.
2/ DP/PROJECTS/R.9/Add.1.

5. While the project has made steady progress and is receiving enthusiastic moral and material support from the participating Governments as well as complementary assistance from bilateral donors, it is evident that in view of the dearth of adequately qualified and trained personnel and material resources in many of the countries concerned, a long-term commitment is needed from all concerned, including external donors, to place national research programmes on a self-reliant basis. In view of the fact that the current UNDP project is scheduled for completion in October 1981, ICRISAT has approached UNDP for a third phase of assistance for a period of five years.

6. The progress and accomplishments of the ICRISAT African Co-operative Programme financed by UNDP were scrutinized in December 1980 by a mission of two independent consultants appointed by UNDP. This mission complimented ongoing work and strongly endorsed the proposal for continuation of UNDP assistance for a further five-year period to permit the expansion of the research and testing activities, together with the enlargement of an intensified training programme to benefit, in particular, those countries where agricultural research systems are still weak. The research and training programmes sponsored by UNDP form an essential and indispensable part of a larger effort of several bilateral and multilateral agencies which are providing substantial inputs of seeds, fertilizers, pesticides and agricultural implements, together with additional technical assistance, to help build up national capabilities in increasing food production in the concerned West African countries.

II. The Project

7. The main objective of the third phase project is to consolidate the work done in the first two phases and to continue an expanded and intensified research and training programme for the improvement of sorghum and millets in several countries of Africa.

8. Specific objectives of the research, testing and training programmes are as follows:

(a) Development of an expanded genetic base of sorghum and millet cultivars from West Africa through assistance to national programmes in collection of germplasm and provision of materials from the large ICRISAT collections of over 19,000 and 12,000 strains of sorghum and millets respectively;

(b) Testing and evaluation of varieties adapted to different agro-ecological conditions through multilocation testing of specific varieties selected from local as well as outside materials available from ICRISAT headquarters in India and other national programmes;

(c) Evaluation of materials showing better yield potential, adaptability, superior grain quality and resistance to pests, diseases and weeds, in particular to Striga (witch weed);

(d) Evaluation of elite varieties in hybridization programmes to develop and test sorghum hybrids with good yield potential;

(e) Development of improved agronomic research, including farming systems through research into improvement of soil fertility and efficient soil and water management to maximize utilization of limited quantities of available rain water;

(f) Study of the interactions of cropping systems, including rotation and the intercropping of sorghum and millets with food legumes, as well as the economics of these systems to maximize the benefits to the small farmer;

(g) Provision of consultants and modest equipment and supplies to selected national institutions to enhance the effectiveness of their participation in the project; and

(h) Development of an expanded training programme, at varying levels, to national staff of all co-operating countries in the afore-mentioned activities.

9. The Administrator intends, through contractual arrangements between ICRISAT and UNDP, to entrust the implementation of this project to ICRISAT, with the clear understanding that the Directorate of ICRISAT will seek the advice of the Food and Agriculture Organization of the United Nations (FAO). As in the past, UNDP will follow closely all the developments in this global project and, together with FAO, will participate in the project advisory committee which will be established for the project. This committee normally will meet once a year to appraise ongoing project activities and to advise on its future direction. Specialists from other international centres will be invited, as appropriate, to serve on this committee.

10. Midway in the course of the project, UNDP, in consultation with ICRISAT, might decide to schedule an evaluation of project activities. Such an evaluation, if needed, could be undertaken by a team of 2-3 independent consultants in conjunction with one of the project advisory committee meetings mentioned in paragraph 9. In any event, towards completion of the project, a thorough evaluation of its results and accomplishments will be mounted by UNDP in consultation with ICRISAT, to be carried out by independent consultants.

11. The expenditure component of the proposed UNDP assistance is:

	$
Subcontract	$5,700,000

12. The expenditures under the project will be contained within the Indicative Planning Figure established by the Governing Council for global projects.

III. Recommendation

13. The Administrator recommends that:

The Governing Council,

(a) Approve this project; and

(b) Authorize the Administrator to make the appropriate arrangements with ICRISAT for the execution of this project.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

International Crops Research Institute for the
Semi-Arid Tropics (ICRISAT) - West African
Sorghum and Millet Improvement Programme (Phase III)
(GLO/81/002)

Corrigendum

Page 4, paragraph 11 should read:

11. The expenditure component of the proposed UNDP assistance is:

	$
Subcontract	5,700,000
UNDP Direct Costs	200,000
Total	5,900,000

* This document will be derestricted upon approval of the project. See document DP/526 which will be issued in June 1981.

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COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Supplementary assistance for a global project

Research, Training and Production Programme for Nutritional Quality Maize, Supported by Farm Level Surveys (GLO/78/009)

Estimated UNDP contribution:	$390 000
Duration:	Three years
Executing Agency:	UNDP

I. Background

1. At its January 1978 meetings,[1/] the Governing Council approved assistance for a project involving a research, training and production programme on nutritional quality maize, supported by farm level surveys. The project is being implemented by the International Maize and Wheat Improvement Centre (CIMMYT) in Mexico, which is part of the network of the international agricultural research centres sponsored by the Consultative Group on International Agricultural Research (CGIAR). The main

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1/ DP/PROJECTS/R.11/Add.2.

objective of CIMMYT is to promote and carry out, at national and international levels, programmes to improve the production of maize and wheat, which constitute the principal carbohydrate and protein source for nearly half the world's population.

2. As part of the CIMMYT effort to assist developing countries in the introduction of new technology for maize production, limited funds from the above UNDP project are being used to support two regional programmes in agricultural economics at the farm level, one in Eastern Africa and the other in South Asia. Both these projects are assisting national programmes with farm level studies on current farmer practices, ascertaining major restrictions to production, identifying changes which could remedy those bottlenecks and ascertaining the availability of inputs and information to farmers. The findings of these studies, in which several staff of national programmes are being trained through workshops and training courses, constitute the basis for "on-farm testing" of improved technology to enable agronomists to verify potential solutions under conditions faced by farmers and to demonstrate modifications to such solutions in the light of new information developed by the experiment stations. The farmer surveys and "on-farm" trials are designed to provide strong guidance to the national extension staff, crop scientists and national policy makers.

3. As a result of the extensive experiences of CIMMYT in agro-economic studies, including those mentioned above, it became evident that there is a deficiency in most developing countries in the communication linkages among biological scientists, social scientists and policy makers. Policy makers frequently complain about the orientation of agricultural research, challenging its relevance to national goals. Agricultural scientists criticize policy makers for their insensitivity to the complexities of biological processes and to both its potentials and limitations. Farmers operate and plan their production programmes within a complex milieu of biological, sociological and economic circumstances. Efforts to develop and to diffuse new technology frequently fail because those in charge of planning research goals or national policy guidelines often do so with little understanding of the circumstances relevant to farmers. In general, a great deal of policy related to agriculture is made in Ministries of Finance, of Planning or Commerce and by people with scant knowledge of technical relationships or farmer situations. Often unaware of the complexities of the environment and compelled by the need for urgent action, these decision makers act independently of counsel from more knowledgeable sources. Even within Ministries of Agriculture, decision makers often act without full awareness of farmers' circumstances and the interaction of those circumstances with technical relationships. Many production programmes have consequently failed because significant elements were overlooked in their formulation. Some planning organizations have attempted to deal with these problems by sophisticated computer models which, obviously, have not had the desired impact.

4. In an attempt to overcome some of the afore-mentioned problems, CIMMYT has developed an alternative strategy which relates policy goals to production systems and examines the biological factors conditioning production in these systems. It examines the farmer and his decision milieu and identifies policy decisions which condition that milieu. This approach relates national goals to production, connects existing production to biological issues, and establishes the effect of current policies on farmers' yields, production and resource allocation. Such an approach requires on-farm trials, interviews with farmers and observations of trained biological scientists and economists. With a view to sharpening the focus of farmers' circumstances and policy, CIMMYT has used UNDP assistance provided under

the present project to develop a number of case studies covering such themes as the organization of agricultural research, the production and distribution of improved seeds. the acquisition and distribution of fertilizers and the performance of markets for produce. This case study method is being tried out in specially designed seminars to bring together policy makers, biological scientists and social scientists to examine farmers' circumstances along with the biological, socio-economic and political factors which impinge on agricultural development. Materials for several case studies have already been prepared and two seminars were held in 1980, one in the Philippines and the other in Kenya, which were attended by participants from different countries with diverse professional backgrounds and job responsibilities in agricultural development activities. During the early part of 1981, three additional seminars were held. one each in Colombia, the Dominican Republic and Bangladesh. CIMMYT staff and skilled outside consultants experienced in the case study method and in agricultural production issues helped lead the various seminar sessions. Reactions from national participants in the above seminars have been favourable, since policy makers had an opportunity to share experiences and perceptions through discussions motivated by the problems presented in the cases. The seminars were considered extremely worthwhile and the materials prepared for the case studies proved to be effective.

5. In agreeing to provide limited funds for the development of case studies and the holding of a few seminars for policy makers on a trial basis, UNDP advised CIMMYT that, subject to the successful outcome of the seminars, consideration would be given to providing supplementary assistance in June 1981 so as to broaden the case study methodology and to hold a few more seminars of the type mentioned above. The present request for supplementary assistance was formulated in view of the seminars' positive results.

II. The Project

6. The main purpose of the supplementary assistance is to enable CIMMYT to develop additional materials for carefully selected case studies focusing on technological, socio-economic, supply and marketing and bureaucratic constraints to the wider, more equitable and more effective adoption of output-increasing innovations in developing countries. Based on the experiences of the seminars for policy makers in the Philippines, Kenya, Colombia, the Dominican Republic and Bangladesh outlined above, additional seminars will be held during the next 2-3 years. Six seminars are scheduled for 1981-1982: consultations are presently under way with the countries interested in hosting the seminars and plans will be finalized in due course. The case studies will be prepared for specific country and subject matter situations and presented in a style which can be easily understood by planners, administrators and decision makers, thereby facilitating close interaction with biological scientists, understanding of the problems of representative farmers and appreciation of what is feasible through agricultural research. The materials in the case studies to be presented in the policy seminars will consist of specially prepared teaching notes, audio-visual aids, including slides and films, discussion papers and technical notes assembled by skilled specialists who are acquainted with current practices of farmers and notes of interviews with scientists, administrators and Government officials in national agricultural programmes. The case studies are intended to serve as the basis for discussion rather than to illustrate effective or ineffective handling of a particular administrative situation. They pose queries which may suggest possible solutions to specific problems. Each seminar includes at least one case relating to

the host country and another five or more on other developing countries. The seminars will be developed around a framework of several case studies which are adapted to the situation of the host country, and will seek to sensitize decision makers to the importance of farmers' circumstances and to the technical parameters of agriculture. The case studies will, as described in paragraph 4 above, deal with important components of national agricultural systems. These materials will be shared with other international development agencies, national Governments and institutions in developing countries.

7. While additional support requested from UNDP will be used mostly for the development and refinement of future case studies, a modest continuation of the current series of seminars for policy makers and administrators is envisaged. Further conduct of these seminars would identify additional opportunities for the development of relevant case studies: testing these case studies and procedures with experienced policy makers and administrators in the developing countries would add substantially to their utility. Although the original case studies and seminars dealt primarily with maize and wheat, the more recent studies and seminars are not commodity-oriented and they cover broad principles that are widely applicable to all crops. Since the materials already developed have been found to be an effective means to document experiences in the agriculture systems of developing countries, several international and bilateral agencies have expressed interest in the approach. In fact, some agencies are already considering the possibilities of financing the presentation of specific seminars. Consultations are already under way between CIMMYT and the International Service for National Agriculture (ISNAR), the newly established entity within the CGIAR network, to transfer the responsibility for the preparation and presentation of the case studies and the seminars to ISNAR during the course of the UNDP project. It is envisioned that future work in this area will be the responsibility of ISNAR, implemented in close collaboration with CIMMYT, other concerned CGIAR-sponsored international agricultural resarch centres, multilateral and bilateral agencies and national institutions in developing countries. ISNAR was created by the CGIAR members to provide assistance to the developing countries in planning, organizing, and managing agricultural research more effectively. This includes assistance in identifying research priorities and problems and in formulating research policies and assistance in building up an adequate institutional infrastructure as well as in promoting specific national or regional research programmes. ISNAR will work very closely with the Food and Agriculture Organization of the United Nations (FAO), all other centres of the CGIAR system, multilateral and bilateral agencies and national Governments of developing countries.

8. The involvement of ISNAR and other agencies and institutions in the aforementioned activities will broaden the current work on case studies and seminars. UNDP assistance during the next three years will permit the development of a richer array of materials for the organization and preparation of the case studies and seminars. That array, in turn, will permit organizers to better tailor seminars to the needs of particular regions or countries, thereby enhancing the utility of each seminar. At the same time, other development assistance agencies will be approached to finance the costs of additional future seminars in which potential interest has been expressed by certain donors and, of course, many developing countries are quite interested in hosting them. It is expected that at least six such seminars will be sponsored during the course of this project. Concerned international agricultural research centres will identify potential participants, with ISNAR playing a co-ordinating role, along with relevant national and

international agencies, in their selection. As in the past, future seminars will be generally sponsored by a national agricultural institution, a post-graduate programme in agricultural sciences of a university, a management training institution or an international centre with strong regional ties.

8. Preparation for the seminars will be shared between the host Government or co-sponsor, with identification and selection of the participants being made in accordance with the arrangements stated above. A critical part of the collaboration involving CIMMYT, ISNAR, all international centres and development assistance agencies is the continuing need for the development of further case studies. Successful seminars rely on three essential ingredients: participants, discussion leaders and substantive materials. The experience gained so far by CIMMYT under the present UNDP project will contribute significantly to the preparation of such materials, thereby enhancing the effectiveness of future policy seminars. CIMMYT will have a detailed work plan prepared in consultation with all concerned for presentation to UNDP so that, immediately upon approval of the supplementary assistance requested above, project activities can be taken in hand on an expeditious basis.

9. As already provided for in the current UNDP project, the additional activities envisaged under supplementary assistance, as described above, will be reviewed by the project advisory committee as and when needed, with appropriate advice from FAO. These activities will also be reviewed by a team of independent consultants, which is scheduled to evaluate the progress and accomplishments of the present UNDP project on maize improvement at CIMMYT before its completion date by the end of March 1984.

10. The expenditure component of the proposed supplementary assistance is as follows:

	$
Subcontract	350,000

11. The expenditures under the project will be contained within the Indicative Planning Figure established by the Governing Council for global projects.

III. Recommendation

12. In the light of the above considerations, the Administrator recommends that:

The Governing Council,

(a) Approve this project; and

(b) Authorize the Administrator to make the appropriate arrangements with CIMMYT for the execution of this project.

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Twenty-eighth session
June 1981
Agenda item 6

COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Supplementary assistance for a global project

Research, Training and Production Programme for Nutritional Quality Maize, Supported by Farm Level Surveys
(GLO/78/009)

Corrigendum

Paragraph 1, line 1

For 1978 read 1979

Page 5

1. Paragraphs 8 to 12 should be renumbered 9 to 13.

2. Paragraph 11 should read:

11. The expenditure component of the proposed supplementary assistance is as follows:

	$
Subcontract	350,000
UNDP direct costs	40,000
Total	390,000

* This document will be derestricted upon approval of the project. See document DP/526 which will be issued in June 1981.